## Unit 7 Lesson 4: Solving Quadratic Equations with the Zero Product Property

### 1 Math Talk: Solve These Equations (Warm up)

#### Student Task Statement

What values of the variables make each equation true?

$6+2a=0$

$7b=0$

$7\left(c−5\right)=0$

$g⋅h=0$

### 2 Take the Zero Product Property Out for a Spin

#### Student Task Statement

For each equation, find its solution or solutions. Be prepared to explain your reasoning.

1. $x−3=0$
2. $x+11=0$
3. $2x+11=0$
4. $x\left(2x+11\right)=0$
5. $\left(x−3\right)\left(x+11\right)=0$
6. $\left(x−3\right)\left(2x+11\right)=0$
7. $x\left(x+3\right)\left(3x−4\right)=0$

### 3 Revisiting a Projectile

#### Student Task Statement

We have seen quadratic functions modeling the height of a projectile as a function of time.

Here are two ways to define the same function that approximates the height of a projectile in meters, $t$ seconds after launch:

$h\left(t\right)=-5t^{2}+27t+18    h\left(t\right)=\left(-5t−3\right)\left(t−6\right)$

1. Which way of defining the function allows us to use the zero product property to find out when the height of the object is 0 meters?
2. Without graphing, determine at what time the height of the object is 0 meters. Show your reasoning.



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